Listing of claims:

1. (Currently Amended) A live attenuated derivative of a pathogenic *Salmonella* species consisting essentially of

(a) a means for regulatable expression of a *fur* gene that encodes a regulatory protein, wherein a regulatable promotor is operably linked to said gene, wherein said gene is expressed when said attentuated strain is in the intestinal tract of an individual and said gene is not expressed when said attenuated strain is within internal tissues of an individual and wherein non-expression of said regulatory protein in vivo causes synthesis of a first antigen that is conserved among *Salmonella* species and *E. coli* strains; and

(b) a means for regulatable synthesis of a first carbohydrate antigen, wherein said first carbohydrate antigen ceases to be synthesized in vivo, exposing a second carbohydrate antigen that is conserved among *Salmonella* species and *E. coli* strains;

wherein said attenuated derivative has enhanced ability to induce cross-protective immunity against *Salmonella* species and *E. coli* strains.

2. (Previously presented) The live attenuated derivative of claim 1, further comprising a means for non-expression of a serotype-specific antigen.

3. (Currently amended) The live attenuated derivative of claim 2, wherein said means for non-expression of a serotype-specific antigen comprises a mutation in a gene selected from the group consisting of *fliC* and *fljB* ~~*fljB*~~.

4. (Previously presented) The live attenuated derivative of claim 3, wherein said mutation is a deletion mutation.

5. (Previously presented) The live attenuated derivative of claim 1, wherein said means of regulatable expression comprises substituting the promoter of said gene that encodes a regulatory protein with a regulatable promoter.

6. (Previously presented) The live attenuated derivative of claim 5 wherein said regulatable promoter is the *ara*CP_{BAD} repressor-activator-promoter system.

7. (Canceled)

8. (Previously presented) The live attenuated derivative of claim 1 wherein said carbohydrate antigen is an LPS O-antigen.

9. (Previously presented) The live attenuated derivative of claim 8 wherein said means for regulatable synthesis comprises a mutation in a gene that encodes a product necessary for synthesis of LPS O-antigen.

10. (Previously presented) The live attenuated derivative of claim 9, wherein said means for regulatable synthesis comprises a mutation in the *pmi* gene.

11. (Previously presented) A method for inducing an immune response sufficient for protection against infection by *Salmonella* species and *E. coli* strains, said method comprising administering to an individual the live attenuated derivative of claim 1.

12. (Currently amended) A live attenuated derivative of a pathogenic *Salmonella* species, consisting essentially of

(a) a means for regulatable expression of a *fur* gene, wherein the *fur* promoter is replaced with a regulatable promotor operably linked to said *fur* gene, wherein said *fur* gene is expressed when said attentuated strain is in the intestinal tract of an individual and said *fur* gene is not expressed when said attenuated strain is within internal tissues of an individual; and

(b) a mutation that renders a *pmi* gene inoperable,

wherein said attenuated derivative has enhanced ability to induce cross-protective immunity against *Salmonella* species and *E. coli*.

13. (Canceled)

14. (Previously presented) The live attenuated derivative of claim 12, wherein said means of (a) comprises replacing the *fur* promoter with the *araC*P_{BAD} activator-repressor-promoter system.

15. (Previously presented) The live attenuated derivative of claim 12 wherein said means of (a) comprises the ΔPfur::*araC*P_{BAD}*fur* genetic construction.

16. (Previously presented) The live attenuated derivative of claim 12 wherein said mutation of (b) is a deletion mutation.

17. (Previously presented) A method of inducing a cross-protective immune response against *Salmonella* species, said method comprising administering to an individual the live attenuated derivative of claim 2.

18. (Canceled)

19. (Currently amended) A vaccine comprising a live attenuated strain of *Salmonella*, wherein said live attenuated strain consists essentially of

(a) a mutation in a *pmi* gene that renders said *pmi* gene non functional; and;

(b) a genetic construction that allows for regulatable expression of a *fur* gene, wherein said *fur* gene is expressed when said attenuated strain is in the intestinal tract of an individual and said *fur* gene is not expressed when said attenuated strain is within internal tissues of an individual, and

wherein said vaccine has enhanced ability to stimulate cross protective immunity against *Salmonella* species and *E. coli* strains.

20. (Canceled)

21. (Previously presented) A vaccine comprising a live attenuated strain of *Salmonella*, wherein said live attenuated strain consists essentially of

(a) a mutation that renders a *pmi* gene non functional; and

(b) a regulatable promotor operably linked to a *fur* gene wherein said *fur* gene is expressed when said attenuated strain is in the intestinal tract of an individual and said *fur* gene is not expressed when said attenuated strain is within internal tissues of an individual.

22. (Previously presented) The vaccine of claim 21 wherein said regulatable promoter comprises the *araC*P_{BAD} activator-repressor-promoter system.

23. (Previously presented) A live attenuated derivative of a *Salmonella* species consisting essentially of

(a) a means for regulatable synthesis of LPS O-antigen side chains, wherein said O-antigen side chains are synthesized when said attenuated derivative is in the intestinal tract of an individual and are not synthesized when said attenuated derivative is within internal tissues of an individual; and

(b) a means for regulatable expression of a *fur* gene, wherein said *fur* gene is expressed when said attenuated derivative is in the intestinal tract of an individual and wherein said *fur* gene is not expressed when said attenuated derivative within internal tissues of an individual

wherein said attenuated derivative has increased ability to induce cross-protective immunity against infection by *Salmonella* species and *E. coli* strains.

24. (Previously presented) The live attenuated derivative of claim 23 wherein said means for regulatable synthesis comprises a mutation in a gene that encodes a product necessary for synthesis of LPS O-antigens.

25. (Previously presented) The live attenuated derivative of claim 24 wherein said gene that encodes a product necessary for synthesis of LPS O-antigens is a *pmi* gene.

26. (Currently amended) [[A]] The live attenuated derivative of claim 1, wherein said pathogenic Salmonella species is a *Salmonella typhimurium* comprising

(a) a ΔPfur::TT*araC*P_{BAD}*fur* deletion-insertion mutation; and

(b) a Δ*pmi* mutation.

27. (Currently amended) The live attenuated derivative of claim 1, ~~A recombinant bacterial strain consisting essentially of a means of regulatable expression of~~ wherein said gene of (a) is a virulence gene[[,]] and wherein said regulatable expression of [[a]] said virulence gene renders said bacterial strain attenuated while maintaining immunogenicity.

28. (Currently amended) The live attenuated derivative ~~recombinant *Salmonella*~~ of claim 27, wherein said virulence gene is selected from the group consisting of *aroA, aroC, aroD, cya, crp, cdt, ompR, htrA, hemA, purA, purB, rfa, rfb, asd ompC* and *ompF.*

29. (Currently amended) The live attenuated derivative ~~recombinant bacterial strain~~ of claim 27, wherein said means of regulatable expression comprises substituting the promoter for said virulence gene with the *araC*P_{BAD} repressor-activator-promoter system.

30. (Currently amended) The live attenuated derivative ~~recombinant bacterial strain~~ of claim 29, wherein said virulence gene is a *fur* gene.

31. (Currently amended) The live attenuated derivative ~~recombinant bacterial strain~~ of claim 30, further comprising a Δ*pmi* mutation.

32. (Currently amended) [[A]] The live attenuated derivative of claim 1 ~~a pathogenic *Enterobacteriaceae* species~~ consisting essentially of a ΔPfur::*araC*P_{BAD}*fur* genetic construction.

33. (Currently amended) A live attenuated derivative of a pathogenic *Salmonella* species consisting essentially of

(a) a means for regulatable expression of a gene that encodes a regulatory protein, wherein a regulatable promotor is operably linked to said gene, wherein said gene is expressed when said attentuated strain is in the intestinal tract of an individual and said gene is not expressed when said attenuated strain is within internal tissues of an individual and wherein non-expression of said regulatory protein in vivo causes synthesis of a first antigen that is conserved among *Salmonella* species and *E. coli* strains; and

(b) a means for regulatable synthesis of a first carbohydrate antigen, wherein said first carbohydrate antigen ceases to be synthesized in vivo, exposing a second carbohydrate antigen that is conserved among *Salmonella* species and *E. coli* strains; and

(c) a mutation of *fliC or fljB*, wherein said mutation results in deletion of the variable domain while retaining the N-terminal and C-terminal constant domains of flagellar proteins;

wherein said attenuated derivative has enhanced ability to induce cross-protective immunity against *Salmonella* species and *E. coli* strains.

34. (Previously presented) The live attenuated derivative of claim 1, further comprising a means for biological containment.

35. (Previously presented) The live attenuated derivative of claim 34, wherein said means comprises a mutation that abolishes motility, prevents synthesis of the exopolysaccharide colanic acid, prevents synthesis of components of the bacterial extracellular matrix, reduces ability to withstand the stresses of stationary phase and starvation, reduces ability to use nucleic acids as a nutrient, or uncouples regulation of cellular activities from a dependence on protein synthesis.

36. (Currently amended) The live attenuated derivative of claim 35, wherein said mutation is selected from the group consisting of Δ(*gmd-fcl*)-26, Δ*agfBAC811*, Δ*bcsABZC2118*, Δ*bcsEFG2319* ~~Δ*bcsABZC2119*~~, Δ*adrA1418*, Δ*mlrA34*, Δ*yhiR36*::TT, Δ*endA2311*, Δ*relA1123*.

37. (Previously presented) The live attenuated derivative of claim 35, wherein said mutation consists of a mutation in a gene selected from the group consisting of *gmd, fcl, agf, bcs, adr, mlr, yhi, end* and *rel.*

38. (Previously presented) The live attenuated derivative of claim 1, further comprising a mutation in a gene selected from the group consisting of *sip* and *sop.*

39. (Previously presented) The live attenuated derivative of claim 38, wherein said mutation is *ΔsopB1925.*

40. (Previously presented) The live attenuated derivative of claim 1, wherein said live attenuated derivative comprises the *ΔilvG3*::TT*ara*CP_{BAD}*lacI* genetic construction.